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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/510,905	02/23/2000	John A. Thodiyil	SUN-P3992-JTF	3744

22200 7590 07/01/2003

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EXAMINER

PHILPOTT, JUSTIN M

ART UNIT	PAPER NUMBER
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2665

DATE MAILED: 07/01/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/510,905

Applicant(s)

THODIYIL, JOHN A.

Examiner

Justin M Philpott

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-22 and 24-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-22 and 24-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. In the Amendment, filed April 25, 2003, Applicant has canceled claims 4 and 23, added new claim 32, and amended claims 1-3, 5, 11-13, 24 and 30 to correct minor informalities and to include limitations of the canceled claims. Applicant has also amended the specification to correct minor informalities and accordingly the specification is no longer objected to. In the remarks (page 12), Applicant declares that at the time of the invention both the instant application and U.S. Patent No. 6,094,435 to Hoffman et al. were commonly owned by, or subject to an obligation of assignment to, Sun Microsystems, Inc. Applicant also agrees to submit a Terminal Disclaimer over Hoffman at the time the application may be in condition for allowance. In view of the anticipated Terminal Disclaimer, Applicant has overcome the previous rejections under 35 U.S.C. 103(a) in view of Hoffman. Furthermore, the pending independent claims previously rejected under 35 U.S.C. 102(e) as being anticipated by Hoffman have been amended to include limitations of the canceled claims which are not explicitly disclosed, but rather are merely suggested, by Hoffman. Thus, in view of the amendments to the claims and the anticipated Terminal Disclaimer, Applicant has overcome the previous rejections under 35 U.S.C. 102(e). In the following action, however, new rejections are made in view of other previously cited art.

Claim Objections

2. Claim 32 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 1.

When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP

§ 706.03(k).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5-7, 9-22 and 24-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,844,890 to Delp et al.

Regarding claims 1, 3, 11, 12, 24, 25 and 32, Delp teaches a method of scheduling data (e.g., via cell scheduler 102 in FIGS. 1 and 2) for transmission over a communication link based on priorities assigned to the data (e.g., see col. 5, lines 23-25 regarding multiple priorities of traffic), comprising: receiving multiple descriptors (e.g., descriptors 206 in FIG. 2) at a communication interface device, each of the descriptors describing a data portion having an associated priority (e.g., see col. 6, lines 63-65 regarding data descriptors; and see col. 5, lines 34 – col. 6, line 53 regarding priority wherein the priority of the data corresponds with the priority

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of the assigned timing wheel); storing the descriptors in a plurality of memories (e.g., see col. 6, line 63 regarding queue of data descriptors) on the communication interface device, wherein each of the memories is configured to store one or more of the descriptors describing data associated with a predetermined priority; maintaining a dynamic weight (e.g., see col. 5, lines 49-56 regarding time slot window) for each of the plurality of memories, wherein each dynamic weight corresponds to a threshold amount of data associated with the predetermined priority (wherein the time slot window and bit rate determine the data amount); and servicing the plurality of memories, wherein each servicing of one of the plurality of memories comprises: (a) receiving a descriptor from the serviced memory (e.g., see col. 6, lines 65-67); (b) retrieving data described by the received descriptor (e.g., see col. 6, line 67 – col. 7, line 2); (c) scheduling the data for transmission via the communication link (e.g., see col. 7, lines 2-3); (d) determining whether an amount of data scheduled during the servicing for transmission via the communication link exceeds the threshold amount of data corresponding to the dynamic weight for the serviced memory (e.g., see col. 8, lines 45-67 and FIG. 7 regarding checking whether slow wheel boundary is crossed); (e) repeating states (a) through (d) for a next descriptor in the serviced memory if the amount of data scheduled for transmission during the servicing is less than the threshold amount of data (e.g., return from step 710 back to step 702); and (f) if the amount of data scheduled for transmission exceeds the threshold amount of data, changing the threshold for a next servicing of the serviced memory (e.g., see col. 9, lines 37-54 wherein a new time slot is calculated). Further, regarding claims 3, 11 and 24, the combined steps of FIGS. 7, 7A and 7B inherently comprise determining whether one of the weights (e.g., time slot) has changed and maintaining a first deficit proportional to the excess of the threshold (e.g., see steps

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720 and 722). Further, regarding claim 25, Delp teaches an arbiter monitors an amount of data received by means of step 720 (see FIG. 7A) and to be placed in a transmission queue (e.g., transmission preparation logic 208). While Delp may not specifically disclose that changing the threshold for a next servicing comprises decreasing the threshold, it is well known in the art that changing a threshold comprises either increasing or decreasing the threshold. Furthermore, by decreasing the threshold for a next servicing when the amount of data scheduled for a transmission exceeds the threshold in a current servicing, a fair or proportional amount of bandwidth can be allocated wherein the excess use of allocated bandwidth occurring in the current servicing is balanced with a reduced allocation of bandwidth for a next servicing. Similarly, Delp specifically teaches a scheduling method which is designed to provide proportional use of available network bandwidth (e.g., see col. 3, lines 15-21). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to decrease the threshold of Delp in order to suitably provide proportional use of available network bandwidth as suggested by Delp (e.g., see col. 3, lines 15-21).

Regarding claim 2, Delp teaches determining if the serviced memory contains a descriptor (e.g., see col. 6, lines 31-42 regarding LCD).

Regarding claim 5, Delp teaches if any of the dynamic weights changes prior to the next servicing, reinstating the pre-decreased threshold for the next servicing (e.g., see col. 9, lines 40-48 wherein the new timestamp may equal the old timestamp with a sustained interval).

Regarding claim 6, Delp teaches determining if a first memory (e.g., corresponding to entries on the slow timing wheel) of the plurality of memories contains less than a predetermined number of descriptors (e.g., see col. 9, lines 19-23 regarding entries within a predefined segment)

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and wherein a request to a host computer (e.g., computing system, see col. 5, line 3) would inherently comprise identifying the first memory.

Regarding claim 7, Delp teaches the first descriptor (e.g., LCD 206) comprises an identifier of a storage area (e.g., data cell queue 204 or slot in the timing wheel) on the host containing the first set of data (e.g., cell) (e.g., see col. 6, lines 11-21 and FIG. 2).

Regarding claim 9, Delp teaches the dynamic weights are dynamically modifiable to adjust the threshold amounts of data (e.g., see col. 9, lines 37-54).

Regarding claims 10 and 20, Delp teaches the interface device is a network interface circuit (e.g., network interface 104 in FIG. 1) and the communication link is a network.

Regarding claim 13, while Delp may not specifically disclose setting the first deficit to zero if a weight changes, it is inherent in the system of Delp for a threshold to change upon a weight change and a change in the threshold inherently requires reconfiguring a deficit. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to set the first deficit to zero if a weight changes in order to properly reconfigure the deficit upon a changed threshold caused by a change in a weight.

Regarding claim 14, Delp teaches determining whether the first memory is empty (e.g., see col. 9, lines 19-23, e.g., wherein a first memory corresponds with a segment of the slow timing wheel).

Regarding claim 15, Delp teaches, as discussed above regarding claim 1, entering an additional servicing (e.g., terminating the first servicing turn and repeating steps (a)-(d)) if the data scheduled for transmission exceeds the first threshold.

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Regarding claim 16, Delp teaches incrementing a data counter (e.g., state(i), see col. 6, lines 11-53) and comparing the data counter to the first threshold (e.g., see col. 9, lines 37-54 regarding comparing timestamp and current time).

Regarding claim 17, Delp teaches the data unit is a cell (e.g., see col. 6, line 17) which inherently comprises a byte.

Regarding claim 18, Delp teaches the method as described above regarding claim 11, and further teaches servicing a second memory (e.g., next LCD) until it is determined to be empty (e.g., see col. 8, lines 18-44).

Regarding claim 19, Delp teaches a first memory corresponds to data having a highest priority (e.g., higher priority traffic, see col. 5, lines 25-28) and upon a weight change (e.g., reconfiguring scheduling) the first memory (corresponding to higher priority traffic) is the next memory serviced (e.g., see col. 5, lines 13-33).

Regarding claim 21, while Delp may not specifically disclose the first dynamic weight (e.g., corresponding to the time slot window) is approximately equal to a maximum packet size of the communication link, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a time slot which accommodates the maximum packet size of the communication link in order to suitably accommodate each packet which is to be processed on the communication link.

Regarding claim 22, while Delp may not specifically disclose the second dynamic weight is approximately equal to one, it is generally considered to be within the ordinary skill in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on

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Appellant. In re Mason, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); Marconi Wireless Telegraph Co. v. U.S., 320 U.S. 1, 57 USPQ 471 (1943); In re Schneider, 148 F.2d 108, 65 USPQ 129 (CCPA 1945); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1955); In re Saether, 492 F.2d 849, 181 USPQ 36 (CCPA 1974); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to have the second dynamic weight approximately equal to one since it is generally considered to be within the ordinary skill in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value.

Regarding claims 26 and 27, Delp teaches a loader (e.g., transmission selection logic cell scheduler 102, see FIG. 2) configured to retrieve a first packet for placing in the transmission queue (e.g., transmission preparation logic 208) during the servicing turn of the first memory, and to load a next descriptor (e.g., LCD 206) for storage in a memory (e.g., queue of data descriptors) (e.g., see col. 6, line 61 – col. 7, line 3).

Regarding claim 28, Delp teaches determining whether an amount of data data placed in the transmission queue during the first servicing turn of the first memory exceeds a first preferred amount of data to be placed in the transmission queue during the first servicing turn of the first memory (e.g., see col. 8, lines 45-67 and FIG. 7 regarding checking whether slow wheel boundary is crossed).

Regarding claims 29 and 30, see the above regarding claim 11.

Regarding claim 31, Delp teaches a multiplexer (e.g., switching/routing system 112, see FIG. 1) configured to pass the descriptor corresponding to a first packet to the above-mentioned

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arbiter and loader (e.g., cell scheduler 102) during the first servicing turn of one of the first and second memory.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Delp in view of U.S. Patent No. 5,732,094 to Petersen et al.

Regarding claim 8, Delp teaches the method as described above regarding claim 1, however, may not specifically disclose transmitting the data scheduled for transmission via the communication link before the entire contents of a packet comprising the scheduled data are scheduled for transmission. Petersen teaches packet transmission of data in a network via a communications link similar to Delp and further teaches transmitting the data scheduled for transmission via the communication link before the entire contents of a packet comprising the scheduled data are scheduled for transmission (e.g., see Abstract, lines 8-12). Such transmission by Petersen provides means for transmitting stream data wherein early sections of data packets can be received and accordingly processed at an increased rate. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply this teaching of Petersen to the method of Delp in order to transmit stream data wherein early sections of data packets can be received and accordingly processed at an increased rate.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin M Philpott whose telephone number is 703.305.7357. The examiner can normally be reached on M-F, 9:00am-5:00pm.

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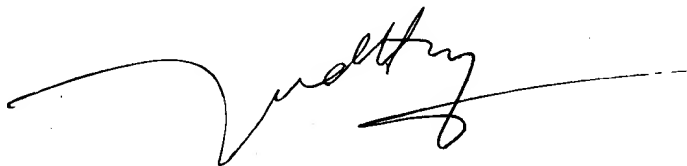
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D Vu can be reached on 703.308.6602. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9314 for regular communications and 703.872.9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.4750.

Justin M Philpott



June 17, 2003



HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600